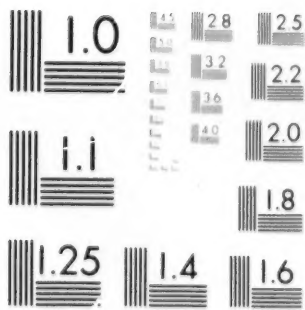




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ABSTRACT

The source of syntactic ambiguity and facts concerning the resolution of such ambiguity are discussed in this paper. The attitude of generative linguists towards ambiguity is examined, and a working distinction is drawn between vagueness and ambiguity. The consequences of this distinction are then examined for syntactic ambiguity and an ordering hypothesis for syntactic rules is proposed. The main issue is the ordering that must hold between optional and obligatory rules. Three observations about syntactic ambiguity are presented: (1) it often escapes attention; (2) even when pointed out to a hearer, the hearer may find it difficult to resolve; and (3) disambiguation by paraphrase is often possible. It is shown that if a linguistic theory wants to take these three factors into account, it must be concluded that syntactic ambiguity is the result of the application of optional rules. The consequence of this conclusion, given the approach to rule ordering, is that for every "n" ways that a sentence is syntactically ambiguous, there must be at least n-1 unambiguous paraphrases. This consequence is tested on three well-known types of ambiguity. In conclusion, observations are made about possibly controversial points, namely, the definition of synonymy and disjunctive rules. (Author/AMH)

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1. The Notion of Ambiguity.

In this paper, I wish to examine the source of syntactic ambiguity, and point out certain facts about the resolution of syntactic ambiguity. It is necessary first of all to maintain a clear distinction between two types of indeterminacy of meaning which tend to be confused rather easily, as can be seen from the following passage of Jan G. Kooij's book "Ambiguity in Natural Language."

"The scope of the term "ambiguity" is rather wide, but may be narrowed down for certain purposes. In everyday usage, "ambiguity" usually refers to the property of sentences that they may be interpreted in more than one way and that insufficient clues are available for the intended or optimal interpretation. The term "ambiguity" is then synonymous with "lack of clarity" or "equivocation", a phenomenon that can be looked upon as a shortcoming of language users, as a deficiency of the system of natural language, or both."

Unfortunately, although Kooij recognises that the terminology concerning linguistic indeterminacy is inadequate, he fails to provide a workable distinction between vagueness and ambiguity; ambiguity is, according to Kooij, "that property of a sentence that it can be interpreted in more than one way."

There is a consensus among linguists that ambiguity is a linguistic phenomenon, whereas vagueness, or lack of specification is "a shortcoming of the language users", to use Kooij's terminology. This sentiment is voiced as follows by Binnick in his paper on Ambiguity and Vagueness:

"The presuppositions involved in ambiguity, [on the other hand] are always linguistically bound; indeed, they are linguistic in nature. It is wrong to think of ambiguity as a case of a word or expression representing two or more "ideas", but rather it is a matter of two or more linguistic terms or categories. Otherwise, we would have to argue that they is ambiguous because it can gloss both (Spanish) ellos and ellas, or that brother in the liberal,

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genetic sense is still ambiguous because it can mean either "older brother" or "younger brother". (cf. Mongolian aga and degü.)

It is made quite clear in the above passage that whatever ambiguity is, it is not captured adequately by reference to potential interpretations. If we are capable of interpreting a sentence or word in more than one way, and the information as to how exactly we are to interpret it is lacking, then it is not necessarily the case that we are dealing with an ambiguity; bicycle is not ambiguous between ladies bicycle and gents' bicycle; it is merely unspecified. "Mary and Sue are secretaries" is not ambiguous with respect to whether they are secretaries with the same company, work in the same office or not etc.; the speaker is simply not providing any information on this point. In Gricean terms, vagueness pertains to the maxim of quantity, and ambiguity to the maxim of manner. As is made clear in the above passage, ambiguity is a notion which is bound up with the rule-system of a language, whereas vagueness is not a linguistic notion, and is not connected with the rules of a language. With ambiguity, the rules of the language have accidentally obscured the difference in structure that existed originally between the two readings for:

(1) "Visiting relatives can be boring."

whereas with vagueness, there never was any structural difference to obscure in the first place. We define ambiguity in linguistic terms; as those instances where more than one structure can underlie the same surface structure which has more than one reading. Vagueness is not defined in linguistic terms; vagueness is the case where the speaker has not given the hearer sufficiently specific information. The remedy for vagueness must be for the speaker to provide more information, make the utterance more specific, whereas with ambiguity the hearer must be enabled to select the appropriate reading for the utterance. This

attitude to ambiguity and vagueness is also expressed by Zwicky/Sadock in their paper: "Ambiguity Tests and How to Fail Them.";

"A test that will not work generally is that of adding material to sentences to force one's understanding. It won't do to claim that

(38) She wore a sweater.

is ambiguous between understandings including "coloured sweater" and "white sweater" on the ground that it is "disambiguated" by addition of the modifier "coloured" or "white". If (38) is merely unspecified, the semantic material will SUPPLY the necessary semantic content, and if (38) is ambiguous, the added material will SELECT the necessary semantic content. That is, the extra elements fail to distinguish between ambiguous and unspecified examples."

But if ambiguity is the result of an accidental collapse into one of two originally different linguistic structures by the rules of the language, then it should be possible to employ the rules of the language to resolve the ambiguity. It is the aim of this paper to investigate this hypothesis for syntax.

II. The Rule-system: Optional/Obligatory rules.

I assume a very general form of a very familiar model of language, namely a model which incorporates a level of surface structure, and a representational level which is related by means of rules to the surface structure. At the surface structure level, sentences have to be judged acceptable by native speakers of the language in question. The representational level is intended to be a systematic, structured representation of the grammatical relations ² that hold in the surface structure sentence; it contains, by definition, no ambiguities, and serves as either a paraphrase of the content of the sentence in question, or as a representation from which the content of the sentence can be readily interpreted. To avoid certain ideological complications, I shall refer to the representational level as the content level, and avoid terms like deep structure, semantic representation, logical form, etc. The actual form of the content level, and the constraints on it, are mostly

immaterial to the argument.

This model of language makes the claim that we do not understand utterances in the form in which they come to us; we decode a sentence to arrive at the content of it, and we encode new contents to make them accessible to hearers. It is obvious that the encoding and decoding in such a model must be rule-governed: Surface structures can contain ambiguities, and are subject to an external well-formedness constraint (they must be judged acceptable by speakers of the language in question) whereas the content-level is not subject to an external well-formedness constraint, and by definition does not contain ambiguities. The rules must exist to ensure that the surface structures are paired with the right representations at the content level, and vice versa.

These relating rules are usually assumed to be of two types: optional and obligatory. Chomsky, in the context of his review of B. F. Skinner's "Verbal Behaviour", distinguished them as follows: (my underlining)

"The rules of a grammar of the appropriate form can be subdivided into the two types, optional and obligatory; only the latter must be applied in generating an utterance. The optional rules of the grammar can be viewed, then as the selective mechanisms involved in the production of a particular utterance."

The function of the obligatory rules must be to ensure a correct relation between a surface structure and the representation of its content; these rules must be applied where they can be applied, and failure to apply one of these rules will lead to either an incorrect surface structure (in the case of encoding) or to an incorrect interpretation (in the case of decoding). The function of optional rules in the domain of syntax is to account for synonymous expressions; quite often we will find that more than one surface structure can be related to the same content. The application of optional rules, then, is at

the discretion of the language user; no ungrammaticality will result from the application or nonapplication of optional rules. Optional rules may be applied when they can be applied; obligatory rules must be applied when they can be applied. From these definitions, we can draw certain conclusions about the ordering of the rules.

If we assume that the application of obligatory rules is not at the discretion of the language user, i.e. that he cannot, by any means, choose not to apply obligatory rules, because if he does, he will produce an ungrammatical sentence, and we assume that he can choose to apply or not apply optional rules, then it must be the case that optional rules form part of processes that apply after obligatory rules have applied to ensure that the sentence in question is well-formed. This again means that if we do not allow our optional rules to produce unacceptable sentences either, then optional rules relate well-formed sentences to each other, whereas obligatory rules relate well-formed sentences to their representations at the content-level.

To demonstrate this, let us assume for a moment that it is possible for optional rules to apply before obligatory rules in such a manner that the optional rules prevent the application of the obligatory rule; the obligatory rule would have applied if the optional rule had not applied.¹⁰ In other words, let us assume that the optional rules are capable of bleeding the obligatory rules. It is obvious that if we adhere to our definition of obligatory and optional rules, such a situation is impossible: If this were possible, then the speaker, by choosing to apply the optional rule, would also choose not to apply the obligatory rule: according to our definitions, ungrammaticality will be the result. It also leads to a theoretically anomalous state of affairs: If we define optional rules as rules that do not affect

the grammaticality of sentences, and obligatory rules as rules that are necessary to ensure the grammaticality of a sentence, then the distinction between the two types of rule is lost if we allow optional rules to bleed obligatory rules and this does not lead to ungrammaticality; obligatory rules do no longer necessarily affect the grammaticality of the sentence. This leads to the following conclusion:

(A) Only obligatory rules can bleed obligatory rules.

The fact that optional rules cannot bleed obligatory rules does not necessarily lead to the conclusion that all optional rules follow all obligatory rules, but it does lead to the conclusion that optional rules apply only to well-formed surface structures: The minimum set of obligatory rules ensuring surface structure grammaticality must have applied before we start to apply any optional rule. This optional rule can then feed further obligatory rules, but these obligatory rules differ from the ones that fed the optional rule in that their configuration, application and, in some cases, their form, are uniquely determined by the application of the optional rule; the application of the optional rule defines the obligatory rules it feeds.

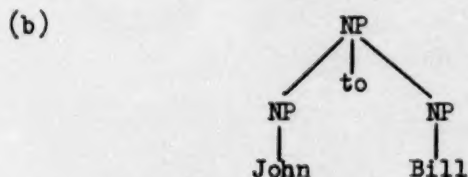
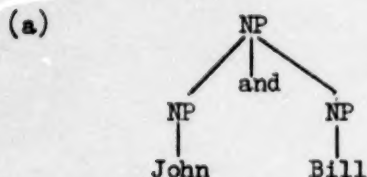
This situation may seem a bit anomalous from a theoretical point of view in that we now postulate a set of obligatory rules whose sole purpose it is to ensure that whatever came out as the output of the optional rule will be a grammatical sentence - in other words, we postulate rules to restore the damage done by the optional rule. A discussion of this problem would take us into the motivation and justification for individual optional rules, which is not the purpose of this paper.

An illustrative example of an optional rule determining an

obligatory rule is provided by the rules of Conjunct Movement and Preposition Adjuntion³ in the article "Phrasal Conjunction and Symmetric Predicates" by George Lakoff and Stanley Peters. They want to postulate rules to account for the relation between:

- (2) "John and Bill are similar."
and
(3) "John is similar to Bill."

One of the rules they postulate is Preposition Adjunction, which transforms the subject NP in (2), which is claimed to have the structure represented in fig. (a), into the (unacceptable) form (2a), which has structure (b):



- (2a) "John to Bill is similar."

Preposition Adjunction, which is an optional rule, is invariably followed by obligatory Conjunct Movement, which transforms (2a) into (3). The process is clear: The obligatory rule is "triggered" by the optional rule, and nothing else can trigger that particular obligatory rule.

The obligatory rules that are fed by optional rules may also occur, at some stage, in the initial set of obligatory rules that related the content of the sentence to the surface structure. An example of this is the Agreement rule. Coordination Reduction can apply to a sentence like:

- (4) John buys flowers on Tuesdays and Bill buys flowers on Tuesdays.
to change it into:
(5) John and Bill buy flowers on Tuesdays.

Obviously, Coordination Reduction is an optional rule by our definitions, since (4) and (5) are synonymous, and both well-formed. However, the

verb has to lose its third person present singular ending in (5), just as no ending will be present in (6):

(6) The boys buy flowers on Tuesdays.

It would be unreasonable to postulate two agreement rules to handle these cases; an obvious generalisation would be missed, since the two rules differ only in what causes their application, and not in how they apply. The agreement rule must apply obligatorily to any sentence before it can be an acceptable surface structure, and can be triggered by a highly specific application of Coordination Reduction, namely where it has applied to leave a singular subject NP coordinated with another singular subject NP.

Obligatory rules like the ones discussed differ from the obligatory rules that relate sentences to the representation of their content in that the latter are primarily determined in their application by the representation at the content level, whereas the application of the former is determined by the application of the optional rule that feeds them.

III Three Observations about Ambiguity.¹¹

With this preliminary argument completed, let us look at some of the characteristics of ambiguity. I shall present three observations, which I shall refer to in the rest of the paper as the first, second and third observations.

First of all, hearers are quite often unaware of ambiguities in the speaker's utterance.⁴ A speaker may confront his audience with a sentence they do not know to be ambiguous, and more often than not they will interpret it in one way without ever realising that another interpretation is also possible.

controversial issue, namely that of the psychological status of grammatical rules. It has always been claimed that in encoding or decoding a sentence, language users do not go through exactly the same rules as the ones linguists have postulated to account for the understanding of language; linguistic rules have no individual existence in the mind of the speaker. Although this has been pointed out quite frequently, it is useful to re-state it. As Seuren, in his paper "Grammar as an Underground Process" points out quite rightly, tacit knowledge, the linguistic skills that enable a language user to communicate, cannot be assumed to be accessible, or open to introspection or awareness.

"It is decidedly odd that, in linguistics as well as in psychology, the concept "psychological reality" has almost invariably implied the criterion of accessibility to awareness, in spite of the often repeated declaration that competence consists of "tacit" knowledge.....We know whether or not we have command of or competence in a language. When we do, we can use it for certain purposes we have knowledge of: we know what we want to say, or what the utterance is we want to understand and interpret. But the principles, or rules, which guide the processes of production and comprehension escape our inspection. They can only be approximated by way of scientific hypotheses and theories. All this has been said so often that one hesitates to repeat it once more."

We assume, then, that the rules and processes linguists postulate to account for the understanding of language may not be incompatible with the activities carried out by speakers when they use language. In other words, our three observations must be reflected in the rule-system we postulate.

We have observed earlier that there exists an optional/obligatory distinction in the rules and processes that linguists postulate, and that ambiguity must be the result of the rules of grammar. This means that it can be the result of either optional or obligatory rules, or of both. Let us assume for a moment that ambiguity arises as the result of obligatory rules; if we come to the conclusion that this cannot be

Secondly, even when the existence of ambiguities is pointed out, hearers may have difficulties in finding all the readings possible for the ambiguous sentence. I may, for instance, claim that:

(7) "He bought her champagne in Paris."

is a two ways ambiguous sentence. It will certainly take most readers longer to arrive at the two possible readings than it would take them to arrive at the readings of two six-word simple sentences which are not ambiguous, and it is even possible that some readers will find only one reading: people not being able to "see" an alleged ambiguity is a familiar phenomenon.

Thirdly, it is never possible to make a vague utterance less vague by giving it a different form, but it is possible to make an ambiguous utterance unambiguous by giving it a different form, without adding anything to the content. I take it that a sentence like:

(8) "He gave old what's-her-name the thingy."

is just as vague as:

(9) "He gave the thingy to old what's-her-name."

On the other hand, a sentence like:

(10) "He heard her scream."

is ambiguous, but

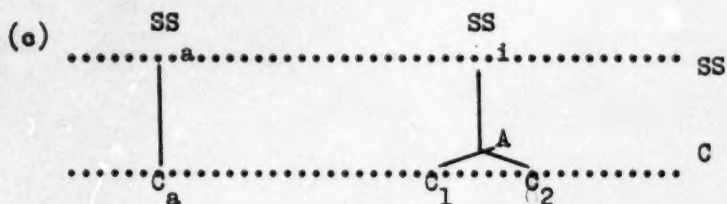
(11) "He heard that she screamed."

is not, and it does not contain more information than the reading of (10) it corresponds to. Under a certain definition of synonymy, (see section V), (10) and (11), like (8) and (9), are synonymous sentences.

Assuming that ambiguity is, in some sense, the result of the application of the linguistic rules, how are we to account for these observations? How does a hearer proceed when he is confronted with an ambiguous sentence? This question plunges us straight into a fairly

the case, then ambiguity must be the result of optional rules.

A schematic representation of how an ambiguity arises will look more or less as follows; C is the content level, and SS is the surface structure level:⁵



A hearer interpreting an unambiguous utterance like SS_a in fig. C will follow the set of (in this particular case, obligatory) rules dictated as necessary by his competence. This set of rules I have represented as the line-running from SS_a to C_a ; in this particular case the decoding will be nonproblematic. But now let us take the case of SS_1 , which is ambiguous. Our hearer here follows the set of rules from SS_1 to A. A is, in this particular model, the ambiguity point; i.e. the point where the accidental collapse into one of the two originally different structures has taken place. At A, he is faced with the fact that he can now follow two paths, one from A to C_1 and one from A to C_2 . Both sets of rules these paths represent are obligatory, so he does not have any choice; he must follow both, arrive at C_1 and C_2 , and come to the (correct) conclusion that the sentence is ambiguous.

He may then ask the speaker for clarification, and now it is the speaker who faces a problem: He meant C_1 , and wants to say just C_1 . However, if he now again takes C_1 , exactly the same content, then he will have to run through exactly the same set of rules, since they were obligatory, which means that he will come up with exactly the same ambiguous sentence SS_1 . In other words, if we want to account for our

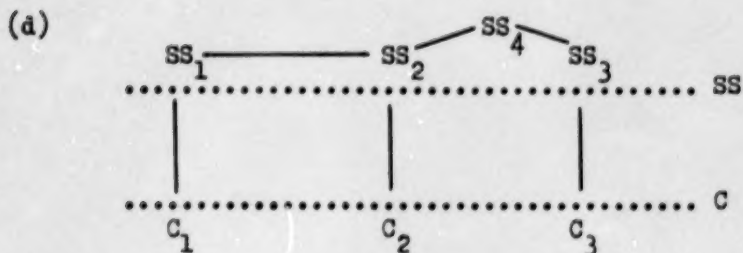
third observation, that it is possible to disambiguate a sentence by changing its form without adding any content, then it must be the case that optional rules are crucially involved in ambiguity.

It can even be demonstrated that optional processes are exclusively responsible for the occurrence of ambiguity. For our first and second observations cannot be accounted for either if we do not assume that ambiguity arises in optional processes. In model (c), as soon as a hearer arrives at the ambiguity point, he has to follow both paths, because both sets of rules these paths represent are completely obligatory, so that he cannot help but detect the ambiguity.

This argument might be countered by saying that speakers, when they are confronted with an ambiguous utterance, proceed to the ambiguity point, follow both paths, and then compare both C_1 and C_2 for compatibility with the context, and eliminate the least compatible one. This entire process could be screened from introspection, so that the hearer is still unaware of the ambiguity. However, this state of affairs still will not account for our second observation. A hearer can be made aware by the speaker that an ambiguous sentence will follow, (i.e. the speaker inserts into the context the fact that the ensuing sentence is going to be ambiguous), so that the comparison and elimination process can not take place. In this case, the hearer should come up with all the readings for the sentence effortlessly and quickly, and we have observed that this is not the case. Since the decoding rules must have access to information which the speaker possesses consciously in this model, we cannot appeal to "screening from access", and so we cannot account for the second observation unless we are willing to postulate that in principle any information can be used in finding the readings for an ambiguous sentence except for the actual knowledge that the

sentence is ambiguous, which is of course manifestly absurd.

We must, therefore, conclude that ambiguity is the result of the application of optional processes. This means, because, as we have argued in section II, optional processes apply after obligatory processes have ensured surface structure grammaticalness, that the ambiguity point must lie at surface structure. The schematic representation of this situation is as follows:



Let us assume that SS_2 is ambiguous between C_1 and C_2 , and that SS_4 is ambiguous between C_2 and C_3 ; SS_3 is unambiguous. In the case of SS_1 , an optional process has applied to collapse it with SS_2 , and has thus created the ambiguity, while to SS_2 , an optional rule can apply to change it into SS_4 . SS_4 can also be the result of an optional process applying to SS_3 , so that we can again create an ambiguity. (Optional processes can, of course, apply to form nonambiguous variant expressions, but we will not be concerned with that for the moment.) A hearer who is confronted with either SS_4 or SS_2 needn't be aware of the ambiguity, because there is nothing in the rule-system that forces him to recognise an ambiguity point when he arrives at it - only when he starts looking for them will he find ambiguities. This should not be taken to mean that under normal circumstances hearers cannot be aware of ambiguities; for it is quite possible that a hearer, when he is decoding the ambiguous sentence in question, decides on the wrong set of rules, so that he will

come up with the wrong interpretation, given the context, for that sentence, and he may then reinterpret it and arrive at the correct conclusion - in which case, he will be aware of the ambiguity.

It is obvious that our third observation is also naturally accounted for in this model: Since the optional processes relate only well-formed sentences to each other, it must be the case that for every n ways that a sentence is ambiguous, there must be at least $n-1$ synonymous unambiguous expressions corresponding to $n-1$ of the readings of the ambiguous sentence.⁶

IV Consequences of the Approach

The way in which especially our third observation is accounted for provides us with a possible test for the approach. A consequence of the hypothesis that ambiguity is the result of the application of optional processes is that we are now committed to the prediction that for any n -ways ambiguous sentence at least $n-1$ unambiguous variant sentences must exist. We shall attempt to demonstrate this with two well-known examples of ambiguity, namely the Zwicky/Sadock examples They saw her duck and They heard her swallow, and the nominalisation examples of Flying planes can be dangerous, and the connected "mixed nominals".

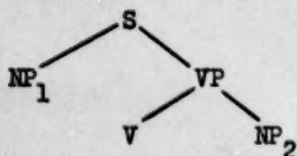
To start with the first, and simplest example, Zwicky/Sadock observe that the sentences quoted before,

- (12) "They saw her duck"
- (13) "They heard her swallow"

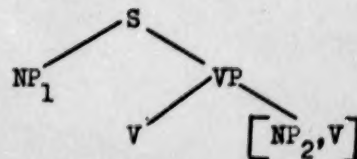
are ambiguous; one reading is where they heard/saw a particular female person perform a particular action, and another reading where they heard/saw a species of bird belonging to a particular female. The

structures corresponding to these readings are: (omitting much detail)

(e)



(f)



It is evident that if we can find an optional rule that can operate on the NP_2 in both structures, we have a good chance of resolving the ambiguity. Such a rule is Clefting; applied to (9) and (10) in the reading corresponding to fig. (e) it will yield:

- (14) "It was her duck which they saw"
- (15) "It was her swallow which they heard"

and applied to the readings represented in fig. (f) it will yield:

- (16) "It was her they saw duck"
- (17) "It was her they heard swallow"

There is, for the reading represented in fig. (f), another possibility, namely that of a straightforward complement clause:

- (18) "They saw that she ducked."
- (19) "They heard that she swallowed."

Thus, we have here a case of ambiguity where the number of unambiguous synonymous sentences is greater than the number of readings for the ambiguous sentence. The same process can be applied to the following list of ambiguous examples:

- (20) "They heard her scream."
- (21) "He felt her blow."
- (22) "John heard her cry."
- (23) "We watched her act."
- (24) "I taught her theory of syntax."
- (25) "You saw her fight."
- (26) "I felt her pinch."

The case where the number of readings equals the number of synonymous expressions is provided by the famous Flying planes can be dangerous ambiguity, and the case where the number of synonymous expressions is one less than the number of readings for the ambiguous sentence

is provided by the "mixed nominals" thereof.

To forestall any questions that might arise on the subject of the acceptability of the examples, let me point out that especially the "mixed" nominalisations are a controversial construction; the following brief quote is taken from Chomsky's "Remarks on Nominalisation":

"[In fact,] there is an artificiality to the whole construction that makes it quite resistant to systematic investigation. Furthermore, the construction is quite limited."

Fortunately, the construction is not so artificial as to prevent a systematic investigation of the possibilities of ambiguity, and the following list, which also serves as a body of data to test the theory against, demonstrates that it is also a class large enough to merit investigation. We have restricted the list to the less artificial possible constructions:

- (27) The flying of the planes.
- (28) The shooting of the hunters.
- (29) The eating of the missionaries.
- (30) The hunting of the indians.
- (31) The taming of the shrews.
- (32) The killing of the soldiers.
- (33) The kicking of the football-players.
- (34) The hitting of the batsman.
- (35) The biting of the dog.
- (36) The stroking of the girls.
- (37) The entertaining of the comedians.
- (38) The kissing of the Soviets.
- (39) The cutting of the diamond.
- (40) The painting of the model.

The first thing to note is that all these examples of mixed nominals exhibit exactly the same type of ambiguity, and that they preserve this ambiguity in the gerundive nominal form; all of them are capable of the Flying planes can be dangerous type ambiguity. Secondly, all the verbs are object-deletion verbs. Furthermore, under one reading the verbs have no overt subject. We can postulate the following very general forms to correspond to the two possible readings:

(g) $np \left[NP, V_o, NP_x \right]_{np}$

(h) $np \left[NP_x, V_o, NP \right]_{np}$

where V_o is an object-deletion verb and NP_x is a non-realised NP.

The forms that preserve the oinear order of these structures and correspond most closely to them are, accordingly:

- (41) Planes that fly.
- (42) To fly planes.
- (43) Hunters who shoot.
- (44) To shoot hunters.

⋮
etc.

We can change these untensed verb forms in the NP into gerundive forms, which has the effect of creating the ambiguities we have noted; thus we have as many unambiguous forms as we have readings for the ambiguous forms.

The genitive form of these expressions presents a more restricted case. There are two genitive forms, corresponding to (g) and (h) respectively, namely the subjective genitive and the objective genitive.⁷ The objective genitive always follows the verb, and is periphrastic, whereas the subjective genitive precedes the verb and is inflected. (45) and (46) illustrate the clear-cut cases:

- (45) The proving of the theorem.
- (46) The lion's growling.

To the subjective genitive, an optional rule may apply under certain circumstances which makes it lose its ending, moves it to postverbal position, and makes it periphrastic; (46) will become:

- (47) The growling of the lion

In the case of object-deletion verbs, where there is a non-realised object NP, this will have the effect of creating the ambiguities

noted above; the objective genitive in this case becomes indistinguishable from the subjective genitive. Thus, we expect to find, for every ambiguous periphrastic genitive form, and unambiguous inflected subjective genitive, which is in fact the case:

- (48) The dog's biting.
- (49) The Soviets' kissing.
- (50) The indians' hunting.

Perhaps the simplest illustration of disambiguation through optional rules is provided by the rule of Gapping. Sentence (51) can be reduced to (52), and sentence (53) can be reduced to (54); although the expanded readings are the preferred ones for the reduced sentences, there is at least the possibility of readings like (55) and (56):

- (51) John feeds the dog dogfood, and John feeds the cat catfood.
- (52) John feeds the dog dogfood, and cat catfood.
- (53) Harry sells old ladies hearing-aids, and Peter sells old ladies gold-rimmed glasses.
- (54) Harry sells old ladies hearing-aids, and Peter gold-rimmed glasses.
- (55) John feeds the dog dogfood, and the cat feeds the dog catfood.
- (56) Harry sells old ladies hearing-aids, and Harry sells Peter gold-rimmed glasses.

And certainly a sentence like (57) does contain an ambiguity, which can easily be resolved by "undoing" the deletion rules that have applied:

- (57) Peter wants Liz to study Linguistics and Sue, Astrophysics.
- (58) Peter wants Liz to study Linguistics and Peter wants Sue to study Astrophysics.
- (59) Peter wants Liz to study Linguistics, and Sue wants Liz to study Astrophysics.

V Controversial Points: The Definition of Synonymy and Disjunctive Rules.

So far, we have left two major issues undiscussed, namely the definition of synonymy and the concept of optionality inherent in disjunctive rules.⁸

We have used, in section IV, the rule of Clefting as an example of an optional rule, and asserted that the clefted sentence is synonymous

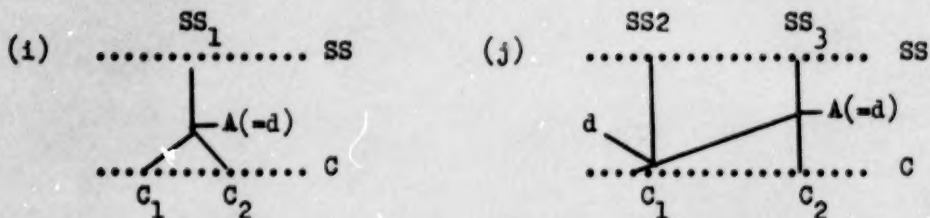
with the unclefted one. This should not be taken to mean that there exists no difference between the clefted and unclefted versions of a sentence; Clefting certainly has an effect upon the sentences it applies to. Quirk et al. describe Clefting as follows:

"A special construction which gives both thematic and focal prominence to a particular element of the clause is the cleft sentence, so called because it divides a single clause into two separate sections, each with its own verb. Most cleft sentence statements begin with the empty pronoun it followed by the verb BE, which is in turn followed by the element on which the focus falls."

If a cleft construction serves to give focal and thematic prominence to a particular element in the sentence, then the cleft sentence can at least in this respect not be called synonymous with its noncleft counterpart, and it might thus be argued⁹ that a cleft sentence is not the optional variant of a noncleft sentence, or vice versa. This does not necessarily invalidate the argument; it merely brings out that our definition of synonymy is very much dependent upon what is taken to be the content of the sentence; two synonymous sentences must have the same content. If focus and theme are taken to be part of the content of the sentence in question, then there are no longer n+1, unambiguous synonymous expressions for sentences like They heard her swallow, but n-1, since the clefted versions are no longer considered to be synonymous with the nonclefted ones. It will be dependent upon what the theory in question defines as constituting the content of sentences, which sentences are synonymous.

The second question is in how far a disjunctive rule can be said to specify optional variants of sentences. We can set up the following hypothetical state of affairs, ignoring, for the moment, the arguments presented in sections II and III. Suppose ambiguity were the result of obligatory rules, and that the optional variants we have noted in section IV should be accounted for by postulating a rule with a

disjunctive output. In that case, ambiguity arises as follows:



In (i), we have postulated two contents, C_1 and C_2 , which are encoded by means of obligatory rules into SS_1 . At one stage, there occurs a rule with a disjunctive input (d), but only one output. C_1 , because of this (obligatory) rule, becomes indistinguishable from C_2 , and the disjunctive rule, in this model, is the ambiguity point.

The question now immediately arises: How does this stage of affairs differ from the one we have rejected in section 3? How do we know we are dealing with ambiguity, and not with vagueness? If there is no way of expressing C_1 without also expressing C_2 and vice versa, and we consciously postulate two different contents and a rule to obscure the difference between the two in our linguistic theory, so that the ambiguity is in fact unobservable, then we have to seriously re-examine the motivation for distinguishing between C_1 and C_2 in the first place, because under these conditions, the state of affairs represented by diagram (i) fits the description of vagueness, not that of ambiguity. We have to specify C_1 to distinguish it from C_2 and vice versa, and selection is not possible.

The distinction between C_1 and C_2 can be motivated if there is a way of expressing the one without also expressing the other or vice versa - i.e. if there is an optional variant of either which is not ambiguous. In other words, if our distinction between vagueness and

ambiguity is correct, there is always a synonymous unambiguous expression for at least one of the readings. This situation might be brought about by postulating a rule with a disjunctive output which then accounts for the optional variants, as in (j). This is not incompatible with our approach, or with the data; an evaluation of this problem we feel not to be within the scope of this paper, however.

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Notes

- (1) I am indebted to Sylvia Adamson, and especially to Terence Moore, for reading an earlier version of this paper and providing many helpful criticisms.
- (2) Whenever I refer to the content of a sentence it is this set of grammatical (i.e. syntactic) relations that I refer to; a treatment of e.g. lexical ambiguity is not within the scope of this paper.
- (3) The fact that I use Conjunct Movement and Preposition Adjunction as illustrative examples is not intended to show that I agree with these rules.
- (4) See especially Chomsky, 1965, pp 21-22.
- (5) It should be kept in mind that these are schematic representations of a linguistic model and are not intended to be "psychologically real" in any other sense than that they do not conflict with the observations in this section.
- (6) This is, in fact not entirely correct. There is at least a theoretical possibility that with three ambiguous surface structures, there is an optional rule collapsing SS_1 and SS_2 , another rule collapsing SS_2 and SS_3 , and a third rule collapsing SS_3 and SS_1 , in which case there are no unambiguous paraphrases for the three ambiguous sentences. No such cases are known to me, and it seems extremely unlikely that this possibility will occur, given that the occurrence of ambiguity is, in fact, a "linguistic accident".
- (7) It is the objective genitive construction which is usually experienced as "awkward" and "artificial".
- (8) I am indebted to Richard Coates for calling my attention to the concept of optionality inherent in disjunctive rules.
- (9) See e.g. Chomsky, 1972a and Lakoff, 1971.
- (10) The terms "feeding" and "bleeding" were introduced by Kiparsky, 1968.
- (11) I am in some doubt about the observational status of the third observation. Although it first came to me as an observation in the course of my work on coordination, I now realise that it is at least as much a consequence of my approach as an independent observation.

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